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EXAMINER	
KIM, DAVID S	
ART UNIT	**PAPER NUMBER**
2633	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/550,649	Applicant(s) GUERTIN ET AL.	
	Examiner David S. Kim	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's compliance with the objections raised in the previous correspondence (Paper No. 7) is noted and appreciated. The drawings were received on 10 February 2004. Fig. 2 is still disapproved; in optical communication element 112, transmitter TX_N is missing a reference character "260" for the internal performance monitor.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

On p. 10, lines 15-16, reference characters "220" and "230" are noted but missing from the Figures.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Applicant's compliance with the objections raised in a previous correspondence (Paper No. 5) is noted and appreciated. However, **claims 1 and 4** are objected to because of the following informalities:

In claim 1, in the last two lines, "value is" is used where "value that is" may be intended.

In claim 4, line 4, "tansmitter" is used where "transmitter" may be intended.

Claim Rejections - 35 USC § 112

4. Applicant's compliance with the issues raised in a previous correspondence (Paper No. 5) is noted and appreciated. Accordingly, the rejections are withdrawn.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. **Claims 1-2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Waschka, Jr. (U.S. Patent No. 4,449,247).

Regarding claim 1, Waschka, Jr. discloses:

A method (Waschka, Jr., col. 15, line 64- col. 19, line 59) of testing a bit error rate for each of *N* (Waschka, Jr., channel links between stations) optical communication channels having *N* (Waschka, Jr., Figs. 2-3, and 9, col. 22, lines 9-33) optical transmitters communicating to *N* optical receivers (Waschka, Jr., Figs. 2-3, and 9, col. 22, lines 9-33, optical detector in col. 16, line 14) via *N* communication channels, the method comprising:

cascading (Waschka, Jr., cascaded channel links in Fig. 1, col. 19, lines 25-28) said *N* optical communication channels such that an electrical (Waschka, Jr., Fig. 9, col. 22, lines 9-33) output of an optical receiver *i* for an optical communication channel *i* is connected to an input of an optical transmitter *i+1* for an optical communication channel *i+1*, for all values of *i* from one to *N-1*, so as to form a continuous cascade of optical transmitter/receiver pairs (Waschka, Jr., col. 19, lines 25-30);

supplying (Waschka, Jr., sequence from sequence generators 173 or 174 in Fig. 8, col. 18, lines 51-56) a bit error rate test signal from a bit error rate tester (Waschka, Jr., bit error rate test unit 22 in Fig. 8) to an input for a first optical transmitter for a first optical communication channel;

supplying (Waschka, Jr., col. 19, lines 3-12) the bit error rate test signal from an output of optical receiver *N* to the bit error rate tester;

detecting (Waschka, Jr., col. 17, lines 14-38, col. 19, lines 3-31) errors in the bit error rate test signal received by the bit error rate tester and calculating therefrom a measured bit error rate (Waschka, Jr., col. 19, lines 3-31); and

comparing (Waschka, Jr., col. 31, lines 3-4) the measured bit error rate with a predetermined system bit error rate threshold;

monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the bit error rate test signal at an input (Waschka, Jr., note sequence detectors 57 and 61 in Figs. 4 and 7, col. 9, lines 42-50, col. 17, lines 14-38) of each of the *N* optical transmitters and each of the *N* optical receivers when the measured bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the *N* optical communication channels has an associated bit error rate value that is greater/less than a specified bit error rate value.

Although Waschka, Jr. does not expressly disclose that the communication system is a wavelength division multiplexed (WDM) optical communication system, Waschka, Jr. does disclose a multiplexed system (Waschka, Jr., multiplexers 155 and 156 in Fig. 7). Additionally, WDM systems are extremely well known in the art and it would have been obvious to a person of ordinary skill in the art to implement WDM system techniques in the system of Waschka, Jr. One of ordinary skill in the art would have been motivated to do so in order to conserve fiber. That is, the system of Waschka, Jr. uses separate fiber links (Waschka, Jr., fiber optic links 17A

and 17B in Fig. 1) for bi-directional communications. Using WDM techniques to send the bi-directional communications over a single fiber link would enable one to reduce the required amount of fiber by half.

Waschka, Jr. also does not expressly disclose:

indicating that the bit error rate for each of the *N* optical communication channels is less than a specified bit error rate value when the measured bit error rate is less than or equal to the predetermined system bit error rate threshold.

However, Waschka, Jr. does disclose providing a BER indication for each of the channels when the measured system BER is unacceptable (Waschka, Jr., col. 19, lines 30-42). In the case that the measured system BER is acceptable (the measured bit error rate is less than or equal to the predetermined system bit error threshold), it would be obvious to a person of ordinary skill in the art to set the BER of each of the communication channels to be less than a specified BER, that is, the predetermined system bit error rate threshold. One of ordinary skill in the art would have been motivated to do this in order to keep the system BER less than the predetermined system bit error rate threshold. More exactly, the system BER is the cumulative sum of the channel BER values. Thus, if the BER of each communication channel is less than the predetermined system bit error rate threshold, the system BER would be less than that same threshold. Accordingly, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to also include said indicating. One of ordinary skill in the art would have been motivated to do this to show the status of the communication channels, informing maintenance personnel of the BER status of the communication channels (Waschka, Jr., col. 5, lines 22-27).

Regarding claim 2, Waschka, Jr. discloses:

The method of claim 1 (see treatment of claim 1 under Waschka, Jr.), wherein said predetermined system bit error rate is equal to the specified bit error rate for each of N optical communication channels (see treatment of claim 1 under Waschka, Jr.).

8. **Claims 3-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Waschka, Jr. as applied to claim 1 above, and further in view of Ransford et al. (U.S. Patent No. 6,351,322 B1).

Regarding claim 3, Waschka, Jr. does not expressly disclose:

The method of claim 1, wherein said monitoring said signal quality includes a bit parity check.

Ransford et al. teaches a method of testing a bit error rate for optical communication systems that includes a bit parity check (Ransford et al., col. 5, lines 14-52). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the method of Ransford et al. in the method of Waschka, Jr. One of ordinary skill in the art would have been motivated to do this since the method of Ransford et al. would enable one to measure the Q-factor of a system. "The Q-factor is generally considered to be a more useful indicator of the accuracy of a transmission circuit" (Ransford et al., col. 1, lines 60-65). Also, the method of Ransford et al. would also enable one to measure the BER of a system in a "dramatically shorter amount of time" (Ransford et al., col. 2, line 17 – col. 3, line 5).

Regarding claim 4, Waschka, Jr. in view of Ransford et al. still does not expressly disclose:

The method of claim 1, wherein said monitoring includes monitoring a bit interleave parity for said bit parity check on each electrical signal in the *N* optical transmitter/receiver pairs.

However, Ransford et al. discloses a preference for SONET transmission signals (Ransford et al., col. 5, lines 15-17). SONET transmission signals conventionally include bytes

for bit interleave parity monitoring. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include monitoring a bit interleave parity for said bit parity checking. One of ordinary skill in the art would have been motivated to do this since this function enables error monitoring of SONET transmission signals.

Regarding claim 5, claim 5 is a method claim that corresponds largely to the method claim 3. Therefore, the recited steps in method claim 3 read on the corresponding steps in method claim 5. Claim 5 also includes a limitation absent from claim 3. Waschka, Jr. in view of Ransford et al. also discloses this limitation:

identifying at least one faulty communication channel from said plurality of optical communication channels (Waschka, Jr., col. 5, lines 45-49) <u>by performing a bit parity check (Ransford et al., col. 5, lines 14-52) by monitoring (Waschka, Jr., col. 19, lines 30-59, col. 30, lines 61-68, col. 31, lines 5-21) a signal quality of the bit error rate signal (Waschka, Jr., col. 9, line 63 – col. 10, line 3, col. 30, lines 61-68, col. 31, lines 3-21) input to each transmitter and each receiver of a transmitter/receiver pair (Waschka, Jr., note that the test signal is input into each transmitter and each receiver of a transmitter/receiver pair, col. 5, lines 28-49, col. 19, lines 13-42) because the measured bit error rate (Waschka, Jr., col. 31, lines 3-4) is greater than a predetermined system bit error rate threshold (Waschka, Jr., col. 31, line 4)</u>.

Regarding claim 6, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 5, further comprising monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the at least one faulty communication channel using an internal performance monitor (Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33).

Regarding claim 7, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 6, wherein said internal performance monitor checks a signal transmitted through the at least one faulty communication channel (Waschka, Jr., col. 19, lines 25-42).

Regarding claim 8, Waschka, Jr. in view of Ransford et al. discloses:

The method of claim 5, further comprising passing said bit error rate test signal through said plurality of optical communication channels (Waschka, Jr., channel links between stations, col. 19, lines 18-30).

Regarding claim 9, claim 9 is a system claim that corresponds largely to the method claim 3. Therefore, the recited steps in method claim 3 read on the corresponding means in system claim 9. Claim 9 also includes a limitation absent from claim 3. Waschka, Jr. in view of Ransford et al. also discloses this limitation:

a diagnostic analyzer (Waschka, Jr., alarm units in Figs. 10-11) to analyze diagnostic output signals (Waschka, Jr., col. 5, lines 31-49) from said transmitters in response to monitoring (Waschka, Jr., col. 19, lines 30-59, col. 30, lines 61-68, col. 31, lines 3-21) a signal quality of said bit error rate signal (Waschka, Jr., col. 9, line 63 – col. 10, line 3, col. 30, lines 61-68, col. 31, lines 3-21) input to each of said transmitters and said receivers (Waschka, Jr., note that the test signal is input into each transmitter and each receiver of a transmitter/receiver pair, col. 5, lines 28-49, col. 19, lines 13-42) and to identify (Waschka, Jr., col. 5, lines 40-42, col. 31, lines 19-21) at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check (Ransford et al., col. 5, lines 14-52) because said measured bit error rate (Waschka, Jr., col. 31, lines 3-4) is greater than said predetermined bit error rate threshold (Waschka, Jr., col. 31, line 4).

Regarding claim 10, Waschka, Jr. in view of Ransford et al. discloses:

The system of claim 8, further comprising an internal performance monitor (Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33) coupled to said diagnostic analyzer.

Regarding claim 11, Waschka, Jr. in view of Ransford et al. discloses:

The system of claim 9, wherein said internal performance monitor includes an error monitoring unit (Waschka, Jr., Fig. 7, col. 15, line 64 – col. 16, line 4).

9. **Claims 1-2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent No. 6,229,631 B1) in view of Waschka, Jr.

Regarding claim 1, Sato et al. discloses:

A method (Sato et al., col. 2, lines 40-43) of testing a bit error rate for each of *N* optical communication channels (Sato et al., optical links between each transmitter/receiver 110, repeater 120, other successive repeaters, and the terminal transmitter/receiver along the "UPWARD" direction of optical fiber 100a in Fig. 12) in a wavelength division multiplexed (Sato et al., col. 9, lines 16-18) optical communication system having *N* optical transmitters (Sato et al., E/O converter 113 in transmitter/receiver 110, E/O converter 123b in repeater 120, and other E/O converters in successive repeaters in Fig. 12) communicating to *N* optical receivers (Sato et al., O/E converter 124a in repeater 120, other O/E converters in successive repeaters, and the O/E converter in the terminal transmitter/receiver in Fig. 12) via *N* communication channels, the method comprising:

cascading (Sato et al., note cascaded configuration of the system in Fig. 12) said *N* optical communication channels such that an electrical output (output from O/E converters 124a in repeater 120 and in successive repeaters and in the terminal transmitter/receiver in Fig. 12) of an optical receiver *i* for an optical communication channel *i* is connected to an input of an optical transmitter *i+1* for an optical communication channel *i+1*, for all values of *i* from one to *N-1*, so as to form a continuous cascade of optical transmitter/receiver pairs;

supplying (Sato et al., estimation parameters in col. 6, line 19 – col. 8, line 20; col. 9, line 66 – col. 10, line 43) a bit error rate test signal <u>(Sato et al., optical signal pattern in Figs. 3-4, col.</u>

7, lines 43-50, col. 8, lines 3-6) from a bit error rate tester (Sato et al., workstation 130 in Fig. 12) to an input for a first optical transmitter for a first optical communication channel;

supplying (Sato et al., col. 10, lines 2-6) the bit error rate test signal from an output of optical receiver *N* to the bit error rate tester; and

detecting (Sato et al., col. 8, lines 15-20) errors in the bit error rate test signal received by the bit error rate tester and calculating therefrom a measured bit error rate;

Sato et al. does not expressly disclose:

comparing the measured bit error rate with a predetermined system bit error rate threshold; and

indicating that the bit error rate for each of the *N* optical communication channels is less than a specified bit error rate value when the measured bit error rate is less than or equal to the predetermined system bit error rate threshold; and

monitoring a signal quality for the bit error rate test signal at an input of each of the *N* optical transmitters and each of the *N* optical receivers when the measured bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the *N* optical communication channels has an associated bit error rate value that is greater/less than a specified bit error rate value.

However, Sato et al. does disclose a range of a system margin (Sato et al., col. 2, lines 41-52) related to the bit error rate (Sato et al., col. 6, lines 60-64) and adjusting the system to maintain an optimum operating condition (Sato et al., col. 10, lines 37-43). In determining the bounds of that margin, it is obvious that one bound would be a predetermined system BER threshold. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to compare the measured system BER with the predetermined system BER threshold. One of ordinary skill in the art would have been motivated to do this in order to know if the system of Sato et al. is operating within the range of its system margin. If the result

of this comparison indicates that the system is operating outside of this range, recovery measures could be taken to ensure that the system is operating within the range (Sato et al., col. 1, lines 42-46).

Additionally, Waschka, Jr. teaches a method of testing a bit error rate in a similar optical communication system that comprises a monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) of a signal quality for a bit error rate test signal. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the general concept of this monitoring in the method of Sato et al. One of ordinary skill in the art would have been motivated to do this to determine the location of faults along the transmission line (Waschka, Jr., col. 19, lines 38-54; Sato et al., col. 1, lines 33-41).

Also, although Waschka, Jr. teaches performing said monitoring at an input of each of its own optical transmitters and each of its own optical receivers, the structural details of Waschka, Jr. and Sato et al. do differ. It is debatable whether or not it would be technically obvious to perform said monitoring at an input of each of the optical transmitters of Sato et al. *in the same way* that Waschka, Jr. does. That is, while it is obvious to implement said monitoring of Waschka, Jr. in the system of Sato et al., it is not clear that it would be obvious to implement said monitoring of Waschka, Jr. in the system of Sato et al. *with the same exact structural details* of Waschka, Jr. Nonetheless, Sato et al. teaches the general monitoring of each device in its system (Sato et al., col. 2, lines 40-46). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform the monitoring of a signal quality for a bit error rate test signal of Waschka, Jr. at any device and location in the system of Sato et al., including at the input of each of the optical transmitters of Sato et al. One of ordinary skill in the art would have been motivated to do this to more exactly isolate the location of any sources of degradations in the signal quality of the bit error rate test signal. In the instant case of monitoring an input of each of the optical transmitters of Sato et al., one of ordinary skill in the

art would have been further motivated to do this to monitor the internal repeater equipment (including inputs to each of the optical transmitters) of Sato et al. for excessive BER (Waschka, Jr. col. 4, line 64 – col. 5, line 5).

Moreover, Waschka, Jr. discloses providing a BER indication for each of the channels when the measured system BER is unacceptable (Waschka, Jr., col. 19, lines 30-42). In the case that the measured system BER is acceptable (the measured bit error rate is less than or equal to the predetermined system bit error threshold), it would be obvious to a person of ordinary skill in the art to set the BER of each of the communication channels to be less than a specified BER, that is, the predetermined system bit error rate threshold. One of ordinary skill in the art would have been motivated to do this in order to keep the system BER less than the predetermined system bit error rate threshold. More exactly, the system BER is the cumulative sum of the channel BER values. Thus, if the BER of each communication channel is less than the predetermined system bit error rate threshold, the system BER would be less than that same threshold. Accordingly, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to also include said indicating. One of ordinary skill in the art would have been motivated to do this to show the status of the communication channels, informing maintenance personnel of the BER status of the communication channels (Waschka, Jr., col. 5, lines 22-27).

Regarding claim 2, Sato et al. in view of Waschka, Jr. discloses:

The method of claim 1 (see treatment of claim 1 under Sato et al. in view of Waschka, Jr.), wherein said predetermined system bit error rate is equal to the specified bit error rate for each of N optical communication channels (see treatment of claim 1 under Sato et al. in view of Waschka, Jr.).

10. **Claims 3-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of Waschka, Jr. as applied to claim 1 above, and further in view of Ransford et al.

<u>Regarding claim 3</u><u>, Sato et al. in view of Waschka, Jr. does not expressly disclose:</u>

<u>The method of claim 1, wherein said monitoring said signal quality includes a bit parity check.</u>

Ransford et al. teaches a method of testing a bit error rate for optical communication systems that includes a bit parity check (Ransford et al., col. 5, lines 14-52). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the method of Ransford et al. in the method of Sato et al. in view of Waschka, Jr. One of ordinary skill in the art would have been motivated to do this since the method of Ransford et al. would enable one to measure the BER of a system in a "dramatically shorter amount of time" (Ransford et al., col. 2, line 17 – col. 3, line 5).

Regarding claim 4, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., still does not expressly disclose:

<u>The method of claim 1, wherein</u> said monitoring includes monitoring a bit interleave parity for said bit parity check on each electrical signal in the *N* optical transmitter/receiver pairs.

However, Ransford et al. discloses a preference for SONET transmission signals (Ransford et al., col. 5, lines 15-17). SONET transmission signals conventionally include bytes for bit interleave parity monitoring. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include monitoring a bit interleave parity for said bit parity checking. One of ordinary skill in the art would have been motivated to do this since this function enables error monitoring of SONET transmission signals.

Regarding claim 5, claim 5 is a method claim that corresponds largely to the method claim 3. Therefore, the recited steps in method claim 3 read on the corresponding steps in method claim 5. Claim 5 also includes a limitation absent from claim 3. Sato et al. in view of Waschka, Jr., further in view of Ransford et al., also discloses this limitation:

identifying at least one faulty communication channel from said plurality of optical communication channels (Waschka, Jr., col. 5, lines 45-49) by performing a bit parity check (Ransford et al., col. 5, lines 14-52) by monitoring (Waschka, Jr., col. 19, lines 30-59, col. 30, lines 61-68, col. 31, lines 5-21) a signal quality of the bit error rate signal (Waschka, Jr., col. 9, line 63 – col. 10, line 3, col. 30, lines 61-68, col. 31, lines 3-21) input to each transmitter and each receiver of a transmitter/receiver pair (Waschka, Jr., note that the test signal is input into each transmitter and each receiver of a transmitter/receiver pair, col. 5, lines 28-49, col. 19, lines 13-42) because the measured bit error rate (Waschka, Jr., col. 31, lines 3-4) is greater than a predetermined system bit error rate threshold (Waschka, Jr., col. 31, line 4).

Regarding claim 6, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 5, further comprising monitoring (Waschka, Jr., col. 19, lines 30-59, col. 31, lines 5-21) a signal quality for the at least one faulty communication channel using an internal performance monitor (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33).

Regarding claim 7, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 6, wherein said internal performance monitor checks a signal transmitted through the at least one faulty communication channel (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., col. 19, lines 25-42).

Regarding claim 8, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The method of claim 5, further comprising passing said bit error rate test signal through said plurality of optical communication channels (Sato et al., optical links between each transmitter/receiver 110, repeater 120, other successive repeaters, and the terminal transmitter/receiver along the "UPWARD" direction of optical fiber 100a in Fig. 12 incorporating the concept of Waschka, Jr., channel links between stations, col. 19, lines 18-30).

Regarding claim 9, claim 9 is a system claim that corresponds largely to the method claim 3. Therefore, the recited steps in method claim 3 read on the corresponding means in system claim 9. Claim 9 also includes a limitation absent from claim 3. Sato et al. in view of Waschka, Jr., further in view of Ransford et al., also discloses this limitation:

a diagnostic analyzer (Sato et al., workstation 130 in Fig. 12, col. 10, lines 2-6 incorporating the concept of Waschka, Jr., alarm units in Figs. 10-11) to analyze diagnostic output signals (Waschka, Jr., col. 5, lines 31-40) from said transmitters <u>in response to monitoring (Waschka, Jr., col. 19, lines 30-59, col. 30, lines 61-68, col. 31, lines 3-21) a signal quality of said bit error rate signal (Waschka, Jr., col. 9, line 63 – col. 10, line 3, col. 30, lines 61-68, col. 31, lines 3-21) input to each of said transmitters</u> and said receivers <u>(Waschka, Jr., note that the test signal is input into each transmitter and each receiver of a transmitter/receiver pair, col. 5, lines 28-49, col. 19, lines 13-42)</u> and to identify (Waschka, Jr., col. 5, lines 40-42<u>, col. 31, lines 19-21</u>) at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check (Ransford et al., col. 5, lines 14-52) because said measured bit error rate <u>(Waschka, Jr., col. 31, lines 3-4)</u> is greater than said predetermined bit error rate threshold <u>(Waschka, Jr., col. 31, line 4)</u>.

Regarding claim 10, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The system of claim 8, further comprising an internal performance monitor (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the

monitoring concept of Waschka, Jr., BER test circuitry in each station, col. 19, lines 30-33) coupled to said diagnostic analyzer.

Regarding claim 11, Sato et al. in view of Waschka, Jr., further in view of Ransford et al., discloses:

The system of claim 9, wherein said internal performance monitor includes an error monitoring unit (Sato et al., controllers 116 and 126 in each transmitter/receiver and repeater in Fig. 12 incorporating the monitoring concept of Waschka, Jr., Fig. 7, col. 15, line 64 – col. 16, line 4).

Response to Arguments

11. Applicant's amendments and arguments filed on 29 December 2003 (Paper No. 6) have been fully considered but they are not persuasive. Applicant's arguments rely on newly introduced limitations to the independent claims 1, 5, and 9.

Regarding claim 1 in view of Waschka, Jr., Applicant amended the claim to introduce,

> "monitoring a signal quality for the bit error rate test signal at <u>an input of</u> each of the *N* optical transmitters and <u>each of the</u> *N* optical receivers..." (Paper No. 6, claim 1).

> Based upon this limitation, Applicant states,

> "Although Fig. 4 arguably shows a transmitter (TX in FSK modem 55) and a bit error rate signal (BER) being supplied to modem 55, the drawing does not illustrate any circuitry for monitoring the quality of the BER signals input to modem 55. The BER signals are simply supplied through circuits 57, 58 and 59 along line 74 without being monitored for signal quality" (Paper No. 6, p. 9, middle paragraph).

Examiner respectfully disagrees. In Waschka, Jr., note sequence detectors 57 and 61 in Figs. 4 and 7. These sequence detectors "are used to perform BER testing" (Waschka, Jr., col. 9, lines 42-50). They comprise zero bit detectors 161 and 163 that indicate bit errors (Waschka, Jr., col. 17, lines 14-38). Such testing and indicating results in the BER signals "being monitored for

signal quality." Thus, Applicant's argument regarding claim 1 in view of Waschka, Jr. is not persuasive.

Regarding claims 5 and 9 in view of Waschka, Jr., Applicant amended the claims to introduce,

> "identifying at least one faulty communication channel from said plurality of optical communication channels by performing a bit parity check <u>by monitoring a signal quality of the bit error rate signal input to each transmitter and each receiver of a</u> transmitter/receiver pair ..." (Paper No. 6, claim 5, emphasis Applicant's).

> "a diagnostic analyzer to analyze diagnostic output signals from said transmitters <u>in response to monitoring a signal quality of said bit error rate signal input to each of said transmitters</u> and said receivers and to identify at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check..." (Paper No. 6, claim 9, emphasis Applicant's).

Based upon this limitation, Applicant states,

> "[A]mended claims 5 and 9 are similar to claim 1 in that each recites monitoring signal quality of a bit error rate signal input to a transmitter. As noted above, <u>Waschka</u> fails to teach or suggest this claimed feature. Accordingly, claims 5 and 9 are distinguishable over <u>Waschka</u> at least for reasons discussed above in regard to claim 1" (Paper No. 6, p. 9, middle paragraph, emphasis Applicant's).

Examiner respectfully disagrees. As discussed above in regard to claim 1, Waschka, Jr. teaches this monitoring. Also, see the standing rejections of claims 5 and 9 above. Thus, Applicant's argument regarding claims 5 and 9 in view of Waschka, Jr. is not persuasive.

Regarding claim 1 in view of Sato et al., Applicant states a first point,

> "<u>Sato et al.</u>...apparently does not actually generate a BER signal" (Paper No. 6, p. 11, lines 2-3, emphasis Applicant's).

Examiner respectfully disagrees. As noted in the standing rejection of claim 1 in view of Sato et al. above, note the optical signal pattern in Figs. 3-4, col. 7, lines 43-50, col. 8, lines 3-6. The BER is calculated from this parameter (Sato et al., col. 8, lines 15-20). Accordingly, this signal comprises a BER signal. Thus, regarding this first point, Applicant's argument regarding claim 1 in view of Sato et al. is not persuasive.

Regarding claim 1 in view of Sato et al., Applicant states a second point,

> "Sato et al. fails to teach or suggest monitoring the quality of such a signal" (Paper No. 6, p. 11, lines 8-9, emphasis Applicant's).

Examiner respectfully disagrees. As noted in the standing rejection of claim 1 in view of Sato et al. above, note the optical signal pattern in Figs. 3-4, col. 7, lines 43-50, col. 8, lines 3-6. The BER is calculated from this parameter (Sato et al., col. 8, lines 15-20). Accordingly, this signal comprises a BER signal. Also, BER is a conventional indicator of the quality of a signal. It follows that the calculation of the BER of this signal comprises "monitoring the quality of such a signal." Thus, regarding this second point, Applicant's argument regarding claim 1 in view of Sato et al. is not persuasive.

Regarding claim 1 in view of Sato et al., Applicant states a third point,

> "Sato et al., like Waschka, fails to teach the step of monitoring a signal quality for the bit error rate test signal at an input of each of *N* optical transmitters, as recited in proposed amended claim 1" (Paper No. 6, p. 11, lines 12-15, emphasis Applicant's).

Examiner notes that the standing rejection of claim 1 under Sato et al. already states that Sato et al. alone does not teach said monitoring at an input to each optical transmitter. However, as discussed above in the standing rejection of claim 1 under Sato et al., in response to Applicant's introduction of this limitation, the application of Sato et al. and Waschka, Jr. has been adjusted to account for this newly introduced limitation. Accordingly, the combined teachings of Sato et al. and Waschka, Jr. teach and/or suggest this step. Thus, regarding this third point, Applicant's argument regarding claim 1 in view of Sato et al. is not persuasive.

Regarding claims 5 and 9 in view of Sato et al., Applicant states,

> "As noted above, proposed claims 5 and 9 are similar to claim 1 in requiring monitoring signal quality of a bit error rate signal input to a transmitter, a feature neither taught nor suggested by either Sato et al., Waschka nor Ransford et al. whether taken alone or in combination" (Paper No. 6, p. 11, last paragraph, emphasis Applicant's).

Examiner respectfully disagrees. As discussed above in the standing rejections of claims 5 and 9, in response to Applicant's introduction of this limitation, the application of Sato et al. and Waschka, Jr. has been adjusted to account for this newly introduced limitation.

Accordingly, the combined teachings of Sato et al., Waschka, Jr., and Ransford et al. teach and/or suggest this feature. Thus, Applicant's argument regarding claims 5 and 9 in view of Sato et al. is not persuasive.

As a side note regarding claims 5 and 9, Applicant's argument regarding claims 5 and 9 rely on Applicant's argument regarding claim 1. However, the amended claim 1 and the amended claims 5 and 9 do not disclose the same corresponding limitations. That is, claim 1 discloses (a) monitoring a signal quality for the bit error rate test signal and (b) performing said monitoring *at an input of* each optical transmitter and each optical receiver. Claims 5 and 9 disclose (a) monitoring a signal quality of the bit error rate signal *that is input* to each transmitter and each optical receiver. Thus, Applicant's argument regarding claims 5 and 9 can only rely on a *part* of Applicant's argument regarding claim 1, the part of (a) monitoring a signal quality for the bit error rate test signal, not the part of (b) performing said monitoring *at an input of* each optical transmitter and each optical receiver.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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